

## **Expanded Scope Description**

This provides a more detailed description of the general areas for which NE will accept applications.

- **Structural material and component development, testing and qualification**

This area includes any part of an advanced reactor except for the fuel and cladding which is the subject of the next area. It includes key components such as heat exchangers, steam generators, specialized pumps and valves, core internals such as control rods and fuel channels and supports. This also includes innovative fabrication techniques and advanced instrumentation for irradiation testing and post irradiation examination of structural materials and components.

- **Advanced nuclear fuel development, fabrication and testing (includes fuel materials and cladding)**

This includes any fuel and cladding designed for an advanced reactor including but not limited to advanced thermal reactors and fast reactors with any combination of moderator and coolant. This also includes innovative fabrication techniques and advanced instrumentation for irradiation testing and post irradiation examination of fuel and cladding materials.

- **Development, testing and qualification of instrumentation, controls and sensor technologies that are hardened for harsh environments and secured against cyber intrusion**

This includes advanced sensors and instrumentation technologies that address critical technology gaps for monitoring and controlling nuclear reactors and fuel cycle facilities. These technologies should be in one of these areas: advanced sensors, digital monitoring and control, nuclear plant communication, or advanced concepts of operation.

- **Analysis and evaluation of and for advanced reactor concepts and associated designs, including licensing strategies**

This includes new analyses and evaluations to benefit advanced reactor concept developers such as reactor physics, fuel mass balances from core loading to discharge and waste characteristics, reactor design and performance, safety analyses, risk assessments, and licensing support. This also includes access to the results of prior evaluations and data collection efforts (e.g., an extensive fuel cycle evaluation and screening study and supporting tools).

- **Modeling and simulation, high performance computing, codes and methods**

This includes access to resources and tools developed in the Energy Innovation Hub for Modeling and Simulation and the Nuclear Energy Advanced Modeling and Simulation (NEAMS) program. NEAMS is developing a computational “ToolKit” which is comprised of both reactor and fuel systems analysis capabilities that can be exercised either coupled or independently.

- **Other technical assistance such as subject matter experts, data or information that can support technology development, or confirm key technical or licensing issues**

This includes access to unique nuclear energy R&D infrastructure capabilities, expertise, materials and information available across the National Laboratories and partner facilities that support the development of innovative nuclear technologies outside of the areas described above.